delta-Hexachlorocyclohexane (delta-HCH) (CASRN 319-86-8)

MAIN CONTENTS

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delta-Hexachlorocyclohexane (delta-HCH); CASRN 319-86-8

Health assessment information on a chemical substance is included in IRIS only after a comprehensive review of chronic toxicity data by U.S. EPA health scientists from several Program Offices and the Office of Research and Development. The summaries presented in Sections I and II represent a consensus reached in the review process. Background information and explanations of the methods used to derive the values given in IRIS are provided in the Background Documents.

STATUS OF DATA FOR delta-HCH

File First On-Line 03/31/1987

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	no data	
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	on-line	07/01/1993

_I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

_I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name -- delta-Hexachlorocyclohexane (delta-HCH)
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Not available at this time.

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_I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)

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Not available at this time.

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_II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name -- delta-Hexachlorocyclohexane (delta-HCH)
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Last Revised -- 07/01/1993

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

_II.A. Evidence for Human Carcinogenicity

__II.A.1. Weight-of-Evidence Characterization

Classification -- D; not classifiable as to human carcinogenicity

__II.A.2. Human Carcinogenicity Data

None.

__II.A.3. Animal Carcinogenicity Data

No neoplastic or nonneoplastic effects were noted in livers of male dd mice or Wistar rats given dietary delta-HCH at concentrations ranging from 100-1000 ppm (Ito et al., 1975, 1973a,b; Nagasaki et al., 1972). Both of these studies utilized small numbers of animals treated for 24 weeks and examined only livers. Goto et al. (1972) observed increased incidence of benign and malignant hepatomas in ICR-JCL mice fed for 26 weeks with a 600 ppm mixture of delta- and epsilon-HCH. Individual isomers were not tested.

__II.A.4. Supporting Data for Carcinogenicity

delta-HCH is structurally related to carcinogenic HCH.

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_II.B. Quantitative Estimate of Carcinogenic Risk from Oral Exposure

Not available.

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_II.C. Quantitative Estimate of Carcinogenic Risk from Inhalation Exposure

Not available.

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_II.D. EPA Documentation, Review, and Contacts (Carcinogenicity Assessment)

__II.D.1. EPA Documentation

Source Document -- U.S. EPA, 1986

The 1986 Health and Environmental Effects Profile has received an Agency review.

__II.D.2. EPA Review (Carcinogenicity Assessment)

Agency Work Group Review -- 12/17/1986

Verification Date -- 12/17/1986

Screening-Level Literature Review Findings -- A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the cancer assessment for delta-Hexachlorocyclohexane (delta-HCH) conducted in August 2003 did not identify any critical new studies. IRIS users who know of important new studies may provide that information to the IRIS Hotline at hotline.iris@epa.gov or 202-566-1676.

__II.D.3. EPA Contacts (Carcinogenicity Assessment)

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) or hotline.iris@epa.gov (internet address).

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_III. [reserved]
_IV. [reserved]
_V. [reserved]

_VI. Bibliography

Substance Name -- delta-Hexachlorocyclohexane (delta-HCH)
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_VI.A. Oral RfD References

None

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_VI.B. Inhalation RfD References

None

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_VI.C. Carcinogenicity Assessment References

Goto, M., M. Hattori, T. Miyagawa and M. Enomoto. 1972. Contribution on ecological chemistry. II. Formation of hepatoma in mice after ingestion of HCH isomers in high doses. Chemosphere. 1(6): 279-282.

Ito, N., H. Nagasaki, H. Aoe, et al. 1975. Brief communication: Development of hepatocellular carcinomas in rats treated with benzene hexachloride. J. Natl. Cancer Inst. 54(3): 801-805.

Ito, N., H. Nagasaki, M. Arai, S. Sugihara and S. Makiua. 1973a. Histologic and ultrastructural studies on the hepatocarcinogenicity of benzene hexachloride. J. Natl. Cancer Inst. 51(3): 817-826.

Ito, N., H. Nagasaki, M. Arai, S. Makiura, S. Sugihara and K. Hirao. 1973b. Histopathologic studies on liver tumorigenesis induced in mice by technical polychlorinated biphenyls and its promoting effect on liver tumors induced by benzene hexachloride. J. Natl. Cancer Inst. 51(5): 1637-1646.

Nagasaki, H., S. Tomii, T. Mega, M. Marugami and N. Ito. 1972. Proc. 2nd Int. Symp. Princess Takamatsu Cancer Research Fund. In: Topics in Chemical Carcinogenesis, W. Nakahara, et al., Ed. XIX+530P Illus. University Park Press, Baltimore, MD, USA; Tokyo, Japan. p. 343-353.

U.S. EPA. 1986. Health and Environmental Effects Profile for Hexachlorocyclohexanes. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Solid Waste and Emergency Response, Washington, DC.

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_VII. Revision History

Substance Name -- delta-Hexachlorocyclohexane (delta-HCH)
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Date	Section	Description
08/01/1991	IV.F.1.	EPA contact changed
08/01/1991	VI.	Bibliography on-line
01/01/1992	IV.	Regulatory actions updated
07/01/1993	II.D.3.	Secondary contact's phone number changed
04/01/1997	III., IV., V.	Drinking Water Health Advisories, EPA Regulatory Actions, and Supplementary Data were removed from IRIS on or before April 1997. IRIS users were directed to the appropriate EPA Program Offices for this information.
10/28/2003	II.D.2.	Screening-Level Literature Review Findings message has been added.

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_VIII. Synonyms

Substance Name -- delta-Hexachlorocyclohexane (delta-HCH)
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319-86-8
delta-BENZENEHEXACHLORIDE
delta-BHC
CYCLOHEXANE, delta-1,2,3,4,5,6-HEXACHLORO-
CYCLOHEXANE, 1,2,3,4,5,6-HEXACHLORO-, delta-isomer
ENT 9,234
delta-HCH
1-alpha,2-alpha,3-alpha,4-beta,5-alpha,6-beta-HEXACHLOROCYCLOHEXANE
Hexachlorocyclohexane, delta-
delta-1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE
delta-(aeeeee)-1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE
delta-LINDANE

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Last updated on Thursday, November 18th, 2004
URL: http://www.epa.gov/iris/subst/0163.htm